Experiment No: 10

Experiment Name: Wireless Network Configuration and E-mail Protocol.

Theory:

1. **Wireless Network:** Wireless LAN (WLAN) allows devices to connect using radio signals instead of cables. A wireless Access Point (AP) broadcasts an SSID so laptops, phones, and tablets can join the network and communicate.

   - **Access Point (AP):** The AP provides wireless coverage and connects wireless traffic to the wired network through a switch. It works as a bridge between Wi-Fi devices and the LAN.
   - **Router:** Routers connect different networks and forward data between them. In this experiment, one router serves the 192.168.10.0/24 network and the other serves 192.168.20.0/24, with an inter-router link.
   - **Switch:** Switches connect wired devices in the LAN and forward Ethernet frames. The AP is connected to the switch to extend wireless access to the entire network.

2. **E-mail Protocols:**

   - **SMTP (Simple Mail Transfer Protocol):** SMTP is used to send emails from a client to a mail server and to transfer mail between servers. It operates on port 25 and works in a push-based method.
   - **POP3 (Post Office Protocol version 3):** POP3 is used by clients to download emails from the server. After downloading, emails are usually removed from the server. It works on port 110 and is suitable for single-device access.
   - **IMAP (Internet Message Access Protocol):** IMAP allows users to access emails directly from the server, keeping messages stored in the mailbox. It synchronizes emails across multiple devices and works on port 143.

Components:

1. Cisco Packet Tracer
2. Routers
3. Switches
4. Access Point
5. Wireless Devices (laptops, tablet, smartphone)
6. Wired Devices (PCs, printers)
7. Server
8. Connection cables

Procedure:

Task 1: 2 Routers, 2 Switches Wireless Connection by Access point.

1. Create Network Topology

   - Place two routers, two switches, one access point, and all end devices as shown in the diagram.
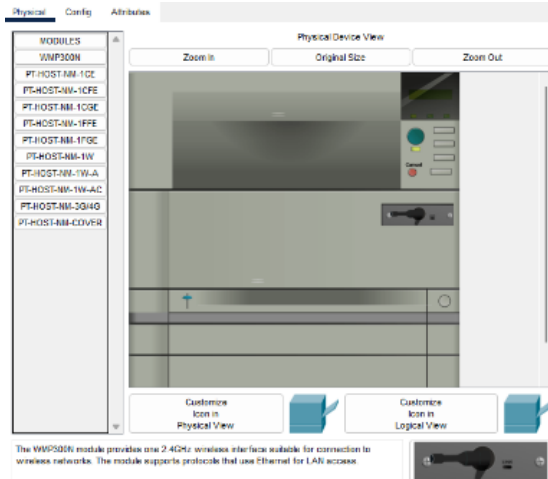   - Connect routers to switches and interconnect the two routers.

Figure 01: Change the Wired Connection to WMP300N.

2. Configure Router Interfaces

- Router0 (Network 10.0): 192.168.10.1
- Router1 (Network 20.0): 192.168.20.1
- Router-to-router link uses the 192.168.200.0 network.
- Enable all interfaces and configure routing so both networks can communicate.

3. Configure the Access Point

- Set SSID (e.g., MOOD).
- Set WEP security.
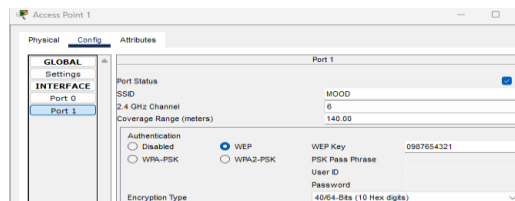- Connect AP to Switch0 so wireless devices join the 192.168.10.0 network.
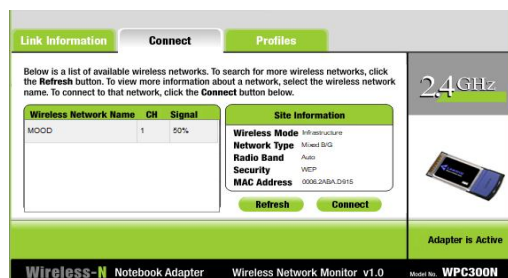

Figure 02: Access Point Configuration.

Figure 03: Pc Wireless interface.

4. Configure End Device IPs

Network 10.0 Devices:	Network 20.0 Devices:
PC – 192.168.10.2	-
PC – 192.168.10.4	Laptop1 – 192.168.20.2
Laptop – 192.168.10.3	-
Smartphone – 192.168.10.6	Laptop2 – 192.168.20.3
Tablet – 192.168.10.7	-
Printer – 192.168.10.5	Printer – 192.168.20.4

- All devices use their router IP as the default gateway.

5. Connect Wireless Devices

- Enable wireless interfaces.
- Select the SSID and enter the password.
- Assign correct IPs.

Figure 04: Wireless Value Input.

6. RIP All Router

Figure 05: RIP Configuration.

7. Test Connectivity

- Ping between wireless and wired devices inside the same network.
- Test cross-network communication (e.g., 192.168.10.5 → 192.168.20.4).
- Successful communication confirms correct wireless and routing setup.
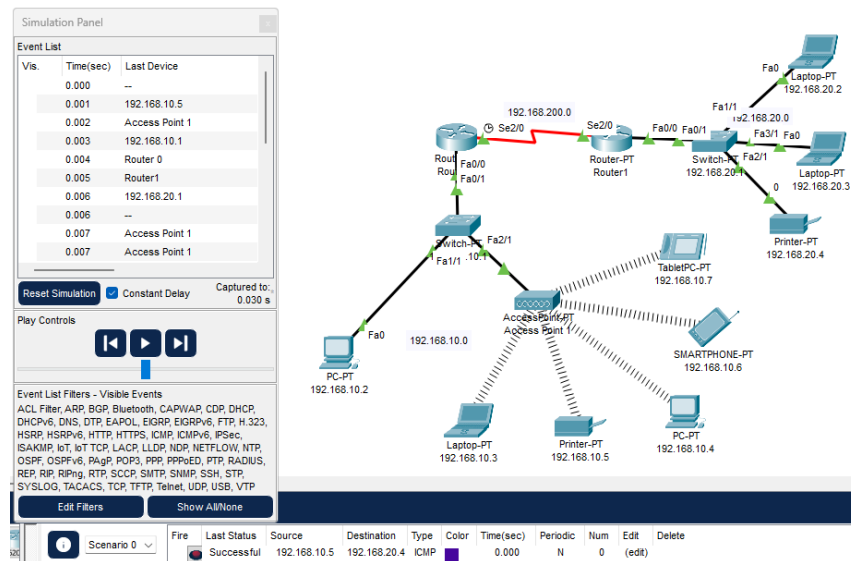

Figure 06: Wireless Configuration.

Task 2: 1 Router, 1 Switch, and 1 Server SMTP and POP3 Configuration.

1. Create Topology:
   - Connect Router → Switch → Laptops, and Router → Server.
2. Assign IP Addresses:
   - Laptop1: 192.168.100.2/24, GW: 192.168.100.1
   - Laptop2: 192.168.100.3/24, GW: 192.168.100.1
   - Server: 192.168.150.2/24, GW: 192.168.150.1
3. Configure Router:
   - Fa0/0 → 192.168.100.1/24
   - Fa0/1 → 192.168.150.1/24
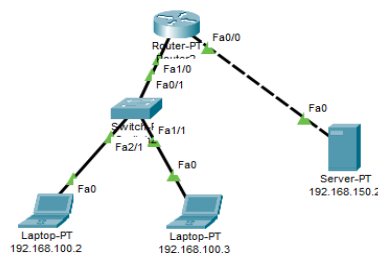   - Enable both interfaces.

Figure 07: Configuration With 1 Router, 1 Switch and 1 Server.

4. Configure Email Server:
   - Turn on SMTP and POP3.
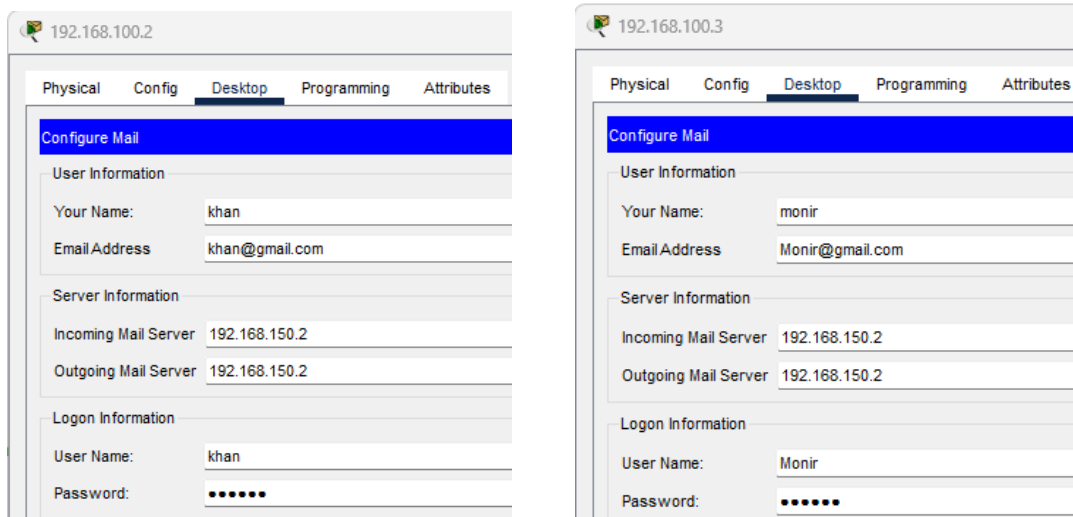   - Create user accounts (example: khan, Monir).

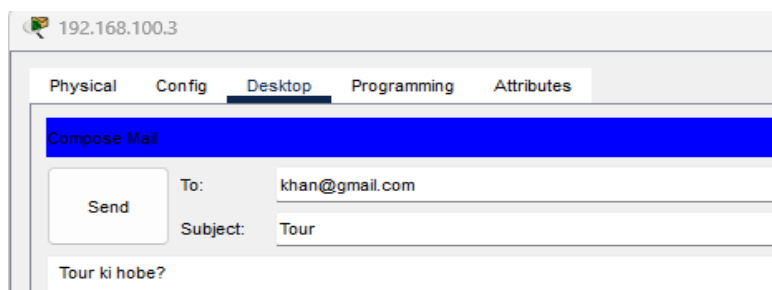**Figure 08:** Configuration Mail.

Figure 09: Compose Mail.

5. Configure Laptops:
   In Email Client, set:
   - Incoming (POP3): 192.168.150.2
   - Outgoing (SMTP): 192.168.150.2
   - Use assigned usernames/passwords.

6. Test Email:
   - Laptop1 → send email to Monir.
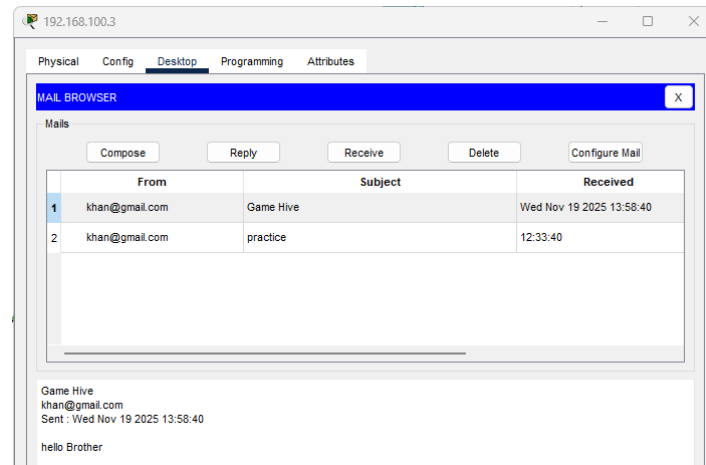   - Laptop2 → receive the email.

Figure 10: Received massage.

Task 3: 2 Router, 3 Switch, 1 Server SMTP and POP3 Configuration.

1. Assign IPs
   - Left laptops: 192.168.0.2
   - Server: 192.168.1.2
   - Right laptops: 192.168.2.3
   - Configure router interfaces exactly as in the diagram (Fa0/0, Fa1/0, Se2/0).
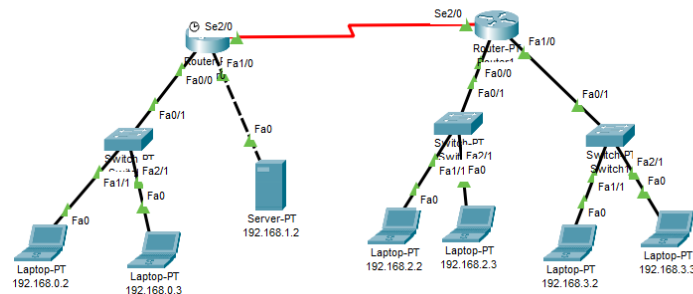

Figure 11: Configuration the routers, switches and server.

2. Configure Routing
   - Add routes on both routers so networks 192.168.0.0, 192.168.1.0, and 192.168.2.0 can reach each other through the serial link.
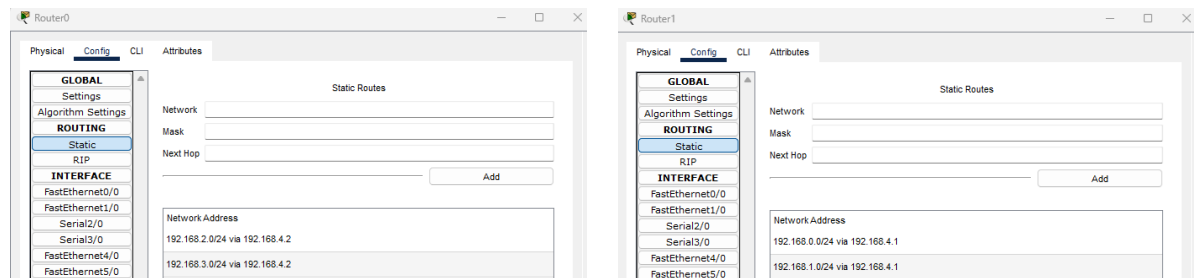

Figure 12: Static Routing.

3. Set Up the Mail Server
   - On the server enable SMTP and POP3.
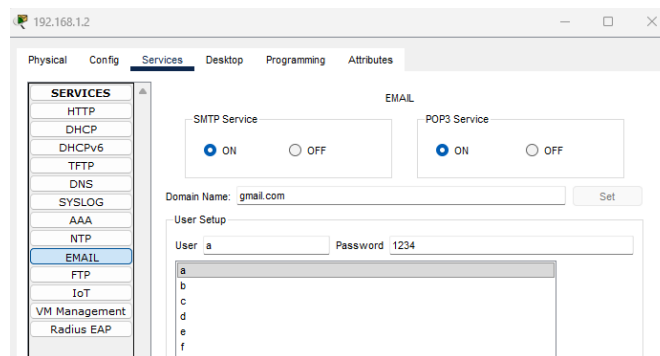   - Create user accounts for all laptops.

Figure 13: Server Email Configuration.

4. Configure Email Clients (Laptops)
   - Set SMTP = 192.168.1.2
   - Set POP3 = 192.168.1.2
   - Enter the assigned email usernames.
5. Send Email
   - Send an email from a left-side laptop (192.168.0.3) to a right-side laptop (192.168.3.2).
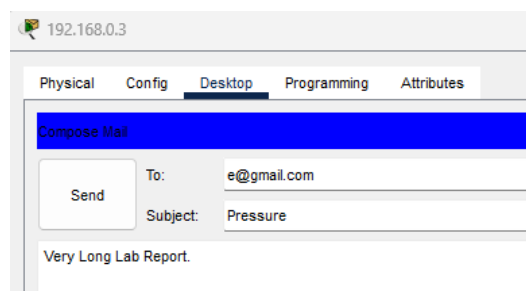

Figure 14: Compose Mail.

6. Receive Email
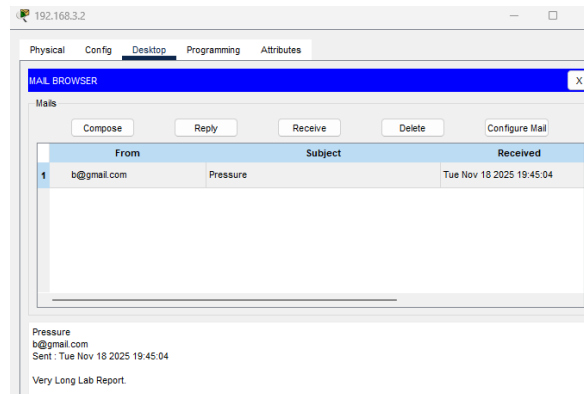   - On the right-side laptop, open the mailbox and download the message via POP3.

Figure 15: Received Massage.

7. Verify
   - Ping the server from both sides and confirm email is successfully sent and received.

Conclusion:

In this experiment, both wireless and wired networks were successfully implemented using routers, switches, and an access point, enabling seamless communication between all connected devices. Correct configuration of IP addressing, routing protocols (RIP and static routes), and wireless security ensured stable and reliable connectivity across the entire network. Additionally, the email protocol setup was completed using SMTP for sending and POP3 for receiving messages. User accounts were created on the mail server, and laptops successfully exchanged emails across different networks, confirming proper server and routing configuration. Overall, the experiment demonstrated the integrated functioning of wireless networking, inter-router communication, and email protocols within a real network environment.